STUDENT LEARNING OBJECTIVE - TEACHER

Content Area: Elect./Robot./Pre-Engineering   **Grade Level:** 12

Objective Statement:
Students will demonstrate an understanding of how to program robots and computers that control manufacturing automation, with an emphasis on the team approach to problem solving in a work environment utilizing state of the art equipment like the Tetrix Robotic System, Scorbot ER-4 Manipulator, and peripherals that include conveyers, sliders, and turntables.

Rationale:
The learning tasks and skills associated with this Objective Statement must be mastered before moving on to the next level of instruction. As students progress through this curriculum, they will build a foundation of knowledge from which they draw upon when given new tasks in their future careers. The industry requires employees to have all of the problem solving, critical thinking, and team effort skills that are embedded in this objective and the curriculum, and so I will be simultaneously preparing students to be career-ready.

Aligned Standards:
GSEs
ET2.1 (9-12)   Students demonstrate an understanding of the attributes of the design process.
ET2.2 (9-12)   Students demonstrate an understanding of technological products and systems.
R-12-2.1(9-12) Students identify the meaning of unfamiliar vocabulary by using various strategies.
M (N&O) -12-7 Students make estimates in situations by determining the level of accuracy.
PS2 (9-12)   Students demonstrate an understanding of energy by describing changing systems.

Industry Standards
EIA-11M-R   Students will develop the abilities to apply the design process.
EIA-10- I-L   Students will understand troubleshooting, R&D, innovation, and problem-solving

CCSS
SL.11-12.1   Initiate and participate effectively in a range of collaborative discussions with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

Students:
This objective applies to 22 seniors in the Electronics/Robotics/Pre-Engineering Program.

Interval of Instruction:
SY2012-2013

Baseline Data:
In looking at historical data, I found that 95% of graduating students who have taken the certification tests within the past 3 years have successfully passed. These same students have averaged a score of 75% on the senior project.

After 4 weeks of introductory work with my current students, this group appears to have a strong set of foundational skills. There are two groups of students who have specific areas of weakness,

but I do not believe any will require a corresponding target, but will merely need strategic supports throughout the year.

Group 1: Four of the students have lower math skills and will need additional explanation, re-teaching, or practice.

Group 2: Seven of the students struggle reading informational text and require comprehension strategies and vocabulary support.

Target(s):
A) Certification Tests:
The target is for all students 22/22 (100%) is to successfully pass all of the certifications.

B) Senior Project:
The target is that all teams will score at least 24 points out of a total of 30 possible points (approx. 80%).

Rationale for Target(s):
A) Certification Tests:
95% of the graduating students who have taken the certification tests within the past years have successfully passed. This group of seniors seems especially motivated and I taught most of them last year, so I have a strong sense of their skills and a good foundation in terms of developing relationships with them and their families.

B) Senior Project:
I based my projected targets on the senior projects on performance of past students, though I have raised my expectation from 75% mastery to 80% mastery on the rubric. I believe that the small adjustments that I have made to my curriculum and instruction will enable me to boost student achievement on this project, as compared to last year.

Evidence Source(s):
A) Certification Tests:
Seniors are required to take certification tests in various content areas of the curriculum. One of which is the ES-4 Digital Electronics Certification Test. In addition, beginning 2012-2013 students will be given a ES-5 Robotics and Automation Certification Test and a LEAN certification test which signifies training and knowledge in the evaluation of assembly line and manufacturing efficiency.

B) Senior Project:
Students will complete a senior project, in which teams of students are presented with a real world problem in manufacturing engineering and the ROV (Remote Operated Vehicle) Industry and are required to program a robot or computer to address the problem. The project will be assessed on a rubric that is aligned to industry standards (4 domains). The rubric also includes a score for working as a member of a team and a score for successfully solving the problem.

Administration:
A) Certification Tests:
The ES-4 Digital Electronics Certification Test is administered by our school certification coordinator. In addition, the ES-5 Robotics/Automation Certification Test and the LEAN certification test will be given beginning in the 2012-2013 school year.

B) Senior Project:
The Senior Projects will be presented the last month of school. Students will have 3 weeks of class time to work in their groups. Final presentations of their projects will take place the last week of class.

Scoring:

A) Certification Tests:
The certification tests are scored by ISCET and RIMES and results of the certifications are sent to the students as well as the school directly from the nationally headquarters of ISCET and RIMES.

B) Senior Project:
The project and project rubric were developed in collaboration with another teacher of this same course in another district. The senior projects will be co-scored by me and a colleague of mine with a strong background in this content area.